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SOME PROBLEMS OF THE SHEEP INDUSTRY

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Is the American sheep industry dying? This seems to be a belated question, since at least three obituaries already have been written and presented in public print during recent months. The nice words about the service the "woolies" have rendered to American agriculture in the past certainly cause many to regret the demise. Too bad! There was a use and service to agriculture from sheep that none other could perform.

The sheep industry, of course, has "died" several times in the past. By some miracle, each time it has been given a rebirth; and with each rebirth it has grown larger, stronger, and more serviceable to American agriculture. On this basis, it might be better for us to think about any additional diagnosis of the present affliction from which the industry suffers and to ask what will aid this rapidly weakening patient to stage another comeback rather than to accept the interment.

During the past 5 years the sheep industry of our country has been undergoing one of the greatest recessions ever recorded. Numbers have declined since 1942 from 49,807,000 to an estimated 32,542,000, or a loss of nearly 35 percent. The number on American farms and ranches is now lower than at any other time since 1867. The basic reason given for disposing of sheep is that they are unprofitable or less profitable than other classes of livestock.

Many explanations for the inability of a sheep-raising enterprise to show a profit have been offered. It has not been long since the basic reason was too much government meddling with the "automatic" law of supply and demand as a "fixer" of prices and profit. This turned during war time into a claimed governmental favoritism toward other more urgently required livestock products for wartime needs.

Another phase has been the wartime accumulation of stock-pile wool, together with the developing uncertainty concerning the future of wool as the most important of textile fibers. For a long time our inability to compete, under our standards of living, on a world basis with those countries where standards are not so high, has seemed a justifiable explanation of some of the ills. Capable and experienced help, which in wartime drifted to industry and tasted of the cup of high wages and short hours, has failed to return to the sheep-raising activities, and thus a serious shortage of experienced help exists. In another field, soil conservationists have noted that erosion and soil fertility losses have brought about a change in the botanical composition of vegetation so that extensive grazing areas are now less suited to sheep than formerly. Inability during wartime to get woven-wire fence to hold sheep, together with the high cost of such fence in the postwar period, may have had some far-reaching effects in sheep liquidation.

There undoubtedly is much that can be said under each one of the aforementioned reasons for regression. There are, undoubtedly, some other reasons which could be added. One thing seems certain--it has all led to a great American confusion. When uncertainty and confusion come in, security and faith in the industry depart. Without faith in the future and some reasonable vision concerning those factors that will promote security, the business is bound to slump.

It seems to a layman that our sheep industry is the victim of a rather ridiculous paradox. On the one hand, there are thousands and thousands of unplowable acres of grazing land better suited to sheep than to any other class of livestock production. There are thousands and thousands of additional acres suited to companion grazing by sheep and other livestock. There is an ever-increasing consciousness of the benefits to posterity which are to follow from a more extensive grassland agriculture in a conservation-of-resources program. Sheep, along with cattle, but superior to cattle pound for pound, are nature's most efficient animal machine for converting such grass and other forage into products useful to man. As a good tenant of the soil, man is obligated to supervise the conversion of these products and restore the residue to the soil as a source of organic matter and fertilizing materials, and thereby to promote and maintain a better agriculture.

Again, there are about 140 million people in our country who require food and clothing as well as home decorating and servicing materials. Our population always has eaten all the good lamb meat produced, and for many, many years our country has imported wool, because the amount produced domestically was inadequate to meet our needs. Also, the byproducts of the sheep industry are all but indispensable. They include buttons, surgical sutures, glandular extracts, cosmetic necessities, some parts of athletic equipment, and so on. The paradox is that in the face of all this tremendous potential of need and use for sheep and sheep products, we are liquidating the industry, accepting the obituaries written by analysts, and calling the industry a decadent and dying feature of American agriculture. The oddity of it is that all this is taking place during a period when wool is worth 40 cents per pound in the grease (i.e., as it comes from the sheep's back), and fat lambs are worth \$20 to \$25 per 100 pounds live weight.

The indication is that there must be something basically wrong within the sheep industry itself. It is axiomatic under our system of democracy that if an industry is profitable it will thrive--if it is unprofitable it will regress and die. Within the sheep industry the short of all this is that if there are not enough pounds of lamb and wool to sell at prices which will carry the burden of production costs and return a profit, the industry will fail. The three keystones in the business structure pertaining to the sheep industry, therefore, are number, and pounds, and their monetary value.

There is nothing unprofitable about high-producing sheep. This past year at the Ohio Agricultural Experiment Station ewes of one breed which reared twin lambs and sheared 12 pounds of wool--on the basis of lamb weight and value at 10 months of age--made a gross return of \$55.84 each ewe. Of this total, \$5.25 came from the ewe's fleece. Ewes of the same breed which reared a single lamb made a gross return of \$28.82 each ewe. The good single lamb will more than pay the bill for keep. Again, other ewes of the same breed which did not lamb or which did not raise a lamb cost about \$18 net, after wool sale, for the

privilege of looking at them and caring for them during the year. Each barren or nonrearing ewe (or in a measure ewes with cull progeny at side which are never profitable) took the profit from several producers to pay their keep. The range of possibility for financial gain or loss in any flock of ewes, therefore, can range all the way from high profit to the flock being an expensive luxury; and it all depends on the productive capacity of the ewes. One hundred ewes, each with twin lambs, as the above twinners show, can make a total return of \$5,584 or, 100 ewes without lambs, as the barren ewes show, can cost the farmer as much as \$1,800--after wool is deducted--for keeping them during the year. Fertility and fecundity--the ability to create and to rear offspring--appear as the keystones to profit and progress in sheep production.

The sour note about the flock from which these records were taken is that the rearing rate was only a little above 70 lambs to each 100 ewes. Since some of the ewes reared twins, the proportion of barren and nonrearing ewes to those which reared lambs was about one out of four.

Readers of this may be startled by this reproductive rate and regard the productive record of the flock cited as ridiculously low. The fact is, however, that the record was selected because it is very typical of the average rate of lamb production by ewes the Nation over. Year after year, statistics are presented which show that the annual lamb crop from ewes in the United States is 70 to 80 lambs for each 100 ewes in the breeding flock. The situation is that about one out of each five ewes exposed to a ram for mating either fails to conceive or fails to rear the lamb or lambs which are born as a result of the mating. If we add the number of nonrearing ewes to the number of ewes that raise unprofitable cull lambs, we find that low fertility or sterility in rams and barrenness or either low or nonrearing ability among ewes shows as one of the prime reasons for the sheep industry being in rapid decline. The machinery in our sheep breeding and rearing factory is actually about 60 percent efficient, considering the matter from the standpoint of one good lamb from each ewe. When the potential is reckoned on the basis that the right sort of ewes can raise good twin lambs, the efficiency of the breeding and rearing machinery in the sheep industry itself is absurdly low.

Of course; there are some good, highly productive flocks throughout the country. The farmer who has such a flock probably has the equivalent of a small gold mine in the back pasture. Don't sell this gold mine short. Those who have less productive sheep should set about to increase the productivity of their flock. The future potential of use and need for sheep in our Nation is too high and opportunity to improve is too great to accept the obituary of the sheep industry by Wall Street or Fortune magazine or to call sheep raising a decadent or dying feature of American agriculture.

The possibility of raising the productive capacity of this Nation's sheep does not seem a fanciful dream. History of two activities and the production philosophies guiding past activity show not only what can be done but in this showing also indicate why the industry is where it is at present.

British flockmasters of a century or more ago, who handed along the heritage of a sheep industry to our Nation, had a sheep breeding and production philosophy that merits close study and application. The whole theme was set to a little verse of just four lines. It ran like this:

"Ewes yearly by twinning
 Rich masters do make.
 The lambs from such twinners
 For breeders go take."

This admonition not only sets forth that the basis of profit is an abundant fecundity, but it also makes clear that the end result is to be attained through breeding and selection.

That the British flockmasters succeeded under the approach to sheep production outlined in the rhyme is attested by numerous records. One record, for example, sets forth that in the early days of the Shropshire breed, 11,666 ewes reared lambs at the rate of 168 lambs per 100 ewes. A common percentage of lambs to ewes bred was 150. Just for comparison's sake, the 10 year average record on a sizable flock of modern Shropshires in our country shows 134 fetuses born to each 100 ewes, with only 103 of these raised. Somewhere and somehow during the past 50 years this flock has lost rearing ability to the extent that 65 lambs less to each 100 ewes are now raised than were raised by their ancestors of 50 to 60 years ago. If this modern flock is typical of others, and the evidence is in that direction, then the rate of deterioration in producing ability of modern sheep-breeding stock is appalling.

The deterioration in rearing ability of breeding stock under the modern approach to sheep breeding apparently is not a new discovery. Britain's Robert Bakewell, who pioneered so-called improved sheep-breeding methods and on whose activity much of modern activity is based, encountered somewhat the same results about 150 years ago. The negative results obtained in this pioneering work, however, have been largely overlooked in pursuing the positive objective which was to improve type and form. Anyone who doubts the foregoing should reread W. Youatt's book, "Sheep," published 110 years ago. "The New Leicesters" said Mr. Youatt, "were not without their faults." "They are not so prolific as most other breeds." "The production of twins was not only unsought after, but was regarded as an evil." "The Leicester tups (rams) were not such sure lamb getters, and the ewes were not so well disposed for impregnation, and the secretion of milk was not so abundant, as in other breeds." "Their lambs were tender and weakly, and unable to bear the occasional unclerency of the weather at the lambing season." Obviously, lower fecundity, lack of twinning ability, sterility in rams, barrenness among ewes, and lack of vigor and high infant mortality were among the results Bakewell and his coworkers obtained in the pioneering work.

It is not to be questioned that the improvements in type and form among livestock of all classes which followed from Bakewell's and similar activity in livestock breeding have been beneficial. No one would want to go back to the indiscriminate admixtures of inferior type and poor body forms which existed among livestock a century or two ago. It is probably time to ask, however, if the purebred sheep industry has not already too long sought extremes in the little "niceties" contributing to perfection in type and form and given far too little attention to maintaining the pay-off factors of high fertility and an abundant fecundity. To frame a policy for positive action, it is time for the sheep industry to get off the basis of pursuing arbitrary and frequently changing standards covering type and form alone and to pursue in a realistic way those production qualities that are measured in terms of number born and raised and pounds of lamb to sell.

As a measure of the increasing seriousness of the problem of low fertility and sterility in rams, barrenness and nonrearing ability among ewes, and lack of vigor and high mortality among lambs, one need only note the increasing activity and effort by scientists to study and solve the problem. Within the past decade or so highly technical studies have been made, under such subjects as the thermoregulatory (temperature control) functions of the scrotum. These studies brought out, among many other things, that a temperature rise of 3 degrees within a male cell-producing organ actually destroyed the sperm-producing ability of the body tissues involved--and the result was temporary and possibly permanent sterility among rams. A heavy layer of fat (such as is promoted in show or otherwise highly fattened rams), or a heavy wool covering on the scrotum (which is another "nicety" in the arbitrary standards concerning type "perfection" among some breeds) actually formed an insulating cover which interfered with normal functioning of the reproductive organ. Thus, fitting practice and breeder notion apparently has actually developed some of the problems now encountered as low fertility or sterility among rams.

Another study concerning the seasonal variation in the fertilizing quality of the semen of males of several breeds has been made. Seasonal variations were found. Males of some breeds showed low or no fertilizing power during the summer season. Attempts by farmers to use such males for breeding in their "off season" cannot expect lambs, or at least should not expect more than a very few lambs. Unadaptability to certain uses on a basis of seasonal sterility lies with some pure breeds.

The value of follicular stimulating hormones (i.e., extracts of the ductless glands in ewes which have regulatory power over the reproductive organs) has been another subject of study. Flocks of ewes have been injected with such hormones. Apparently, "beneficial" results, as manifested by a good and promptly conceived lamb crop, resulted, but why should they need the hormone? The stimulating effect of synthetic drug injections on the manifestations of the mating cycle among females has received some attention. Thus, the work of seeking fact with the hope of solving the problem of low-creating and low-rearing ability goes on. The fundamental question remains--why do sheep require artificial stimulation? Why have they lost some of the ability to create and to rear offspring?

Breeding studies have injected new aspects of this over-all problem of low production. A recent study of the cause of infant mortality--a phase of nonrearing ability among ewes--pointed an accusing finger at inherent or inborn weaknesses as the principal cause. From 73 to 75 percent of the fetuses which failed to survive apparently died because of one weakness or another among the parent stock or poor inheritance for factors of livability among the lambs themselves. An inbreeding, outcrossing experiment to analyze the germ plasm for desirable and undesirable factors showed that 40 percent of the inbred lambs died in infancy. Infant mortality among outbred lambs from similar ewes was 12 percent in one breed and 27 percent of those born in another instance. The lamb crop--on the basis of ewes bred--was 85 and 106 percent in two outbred groups. The inbred group raised at the rate of only 27 lambs per each 100 ewes. Without any twins, the flock analyzes as 73 percent barren or nonrearing.

Another comparison within this study involved the mating of an inbred fertile ram (half brother x half sister mating by the same sire) to his own half sisters, again by the same sire. Eighty-five and seven-tenths percent of these ewes failed to conceive. A companion group of ewes by the same ram was outbred to

an unrelated ram and each ewe became pregnant and lambed. Outbreeding, of course, tends to keep the undesirable factors from showing plainly--inbreeding used as a means of analyzing the germ plasm, as in this case, caused the presence of undesirable factors to be revealed in their stark reality.

Regardless of what else this inbreeding vs. outcrossing study may show eventually it is plain from the first lamb crop that undesirable genes for barrenness, low rearing ability, and high infant mortality were so abundantly present as to result in 27 lambs per 100 ewes bred. If the sheep used are a representative sample of sheep the Nation over, then a major portion of the problem of developing a profitable and forward moving sheep industry, based on production, is a breeding problem.

Such a summary statement should not startle anyone who is at all familiar with the fundamental principles of livestock breeding. Every breeder should know that inheritance determines the extent to which the qualities of any individual may be developed. Environment--or the circumstance with respect to feed, care, and management under which the animal is kept and caused to function--determine whether the inherited capacity of the individual to grow and reproduce will be developed to the maximum extent. There is only one "bridge" between one generation and the next and that is the "germ plasm." Across this bridge a sample of each parent's total inheritance is passed and halved in the creation of each offspring. The progeny can possess only the qualities that each parent can contribute. If the germ plasm of the parents carries undesirable factors, a proportion of the progeny will turn out to be undesirable individuals. If the parents can't pass along a uniform inheritance for high fertility and abundant fecundity, the progeny simply won't have these qualities uniformly. The science of genetics isn't as simple in all details as the foregoing, but the essence of the approach to improved productivity which can be made is as stated.

Regardless of where or how the industry stands at present, the question--what can be done in a practical way to bring about the necessary improvement in number and pounds of lamb to sustain the industry? Obviously, there are only two fields for activity. One is selection to sort out the high-producing strains and breeding to "fix" the production qualities in the germ plasm so that they will be transmitted regularly. The other is environment--to make certain that the conditions under which the animals are kept will promote animal function to the full limit of each individual's inheritance. It won't always be easy or even possible under range husbandry conditions to provide ideal environment because of fluctuations in climatic conditions and feed and water supply. The same limitations, however, need not apply to most of the sheep kept under farm flock conditions; nor are selection practices and breeding principles inapplicable anywhere.

The place to start flock improvement is in connection with the ram or rams to be used. The ram distributes his influence to the progeny of all the ewes to which he is mated; the ewe distributes hers only to the single or twins which she rears and raises. Even should she produce a ram for breeding, the ewe's influence will have been twice halved in her son's get. This does not mean that the ewe's transmissible qualities are less important than the ram's--it only means that their effect is less extensive. The selection of the ram for service, therefore, should be an exacting procedure, because of the extent of his influence.

In the selection of a ram, the first essential is to get a ram that is totally unrelated to the ewes with which he is to be mated. The probability of lower fertility, higher infant mortality, reduced vigor, slower gains, and less efficiency is too great for the commercial sheep grower to practice any inbreeding. The ram selected may be an inbred individual and, if he is inbred from high-producing ancestors for the germinal fixation of factors for high production, he may be a better selection than an outbred ram--but there should be no inbreeding in commercial sheep production.

The second essential is to select the ram from a healthy flock with a record of high production both in number and growth rate of lambs. It won't make any difference whether this flock has ever produced a champion or not. The factors desired are high production--150 or more lambs to each 100 ewes bred--and prompt conception at mating--all the ewes lambing in prompt due course of time after the ram was first turned in. Beware of the flock that strings out the lambing season over 3, 4, or 5 months' time. Such an elongated lambing season is a fairly certain index that the flock is up against the problem of low fertility, slow conception, and too many ewes barren. One must remember that if the ancestors haven't the desired qualities of high fertility and abundant fecundity, their progeny won't have them; and if they don't possess them, they can't pass them along to their progeny. The short of it all is that if one wishes to develop a high-producing flock it must be founded on inheritable qualities for high production among the ancestors.

The third essential in ram selection is to buy from a flock which produces the size and form of lamb the purchaser desires to produce. They must, of course, be of such form as to meet with consumer acceptance. Extremes of form sufficient to win a carcass championship, however, are not necessarily an essential part of economic and profitable commercial sheep production. Academic and show-ring idolizing of form is worth-while artistry from a commercial standpoint only when the individual so idolized is one from among a lamb crop which produces lambs enough, which weighed enough and which brought price enough to pay the cost of production and also leave a margin of profit. If the show-ring lamb does not represent the vital requirements of the commercial industry, then the lamb and its ancestors need not be considered as something of value to the commercial industry. Rather it merely represents a hobbyists' activity within the over-all sheep business.

The fourth and final point to consider in buying a ram is to make every effort to obtain a purebred, registered ram from a flock manifesting the desired production qualities. The purebred possessing good qualities should transmit these good qualities with more certainty than a grade sheep. If the purebred breeder's flock hasn't the qualities outlined--high fertility and prompt conception, good livability, abundant milk, rugged vigor, and a rearing rate well above a lamb for each ewe in the breeding flock, as well as being capable of producing good-formed, uniform lambs that average 90 pounds in weight within 5 months from birth--then buy the ram from whatever unregistered flock can be found that has the required qualities. The purebred breeder will have no basis to fault the commercial grower if his purebred flock can't furnish the production genes that the commercial sheep raiser must insist on if he is to stay in the sheep business, or if our country is to maintain a sheep industry.

In making up the breeding ewe flock the qualities that promote high production should be considered of first importance. Ability to conceive promptly, to rear a good vigorous lamb or a pair of lambs each year, and to furnish the milk which will afford pounds to sell are the most important of all considerations. The basis of such development should be selection. This follows under the thesis that if the parents possess the desired qualities the progeny are more likely to possess the same high production qualities. It is true, too, that stock from a flock showing uniform high production is a better base than the progeny of a few high producers selected from an otherwise low-producing flock.

There are several fallacies in the teaching and practice of sheep husbandry in our country which apparently do not promote forward progress to the maximum extent. For example, culling the ewe flock to remove the low or non-producing ewes has been widely recommended and broadly adopted as an effective means for improving flock production. Culling, however, merely gains the single end of guarding against boarding the barren and other nonrearing ewes and does not of itself make any contribution to improvement in breeding or rearing ability. In any final analysis, culling is merely a useful secondary adjunct to the primary program of selection; and yet much sheep improvement teaching stresses culling and overlooks the point of selection for greater production.

Another fallacy lies in the approach to choosing the young stock to be retained or acquired for breeding. The sheep industry stresses the individual and promotes sales on the basis of the individual sheep's development with respect to type and form when about 18 months of age (Hampshire sheep partly excepted). The cheapest gain and greatest profit in lamb production is that made on ewe's milk. The two most important factors in profitable sheep production are an abundant milk supply, and a lamb vigorous enough to use it all efficiently. There is no tie-up between the acquisition of an 18-month-old sheep--either ram or ewe--on a type and form basis and factual knowledge covering the two most important factors for profit--meaning number born and reared and pounds to sell.

There is still another fallacy in the matter of selecting the young females for replacement. Selections made on the single basis of type and form perfections usually overlook the slightly smaller twins in favor of a larger and fatter single lamb. The ewe with good twins, however, usually has raised far more pounds of lamb to sell. Such selections of the larger single lamb can only result in progressively less and less total pounds of lamb from our sheep population, because the genetic trend is away from twinning and maximum poundage.

Another unsound practice is that of saving only enough ewe lambs to maintain the flock. If a flock, for example, offers 100 young females from which selection can be made, it is likely that about 20 will be retained to keep up the flock. The end result is that the flockmaster has discarded 80 percent of his opportunity to select for production qualities on the basis of performance. Gentlemen! It isn't likely that any industry can operate efficiently and improve production using a false basis for selection and also discarding 80 percent of its opportunity to select for higher efficiency in production. The tragedy is that we have followed for 75 years--or since the first sheep Record Society--the policy of glorifying and using as the standard the 18-month-old or older individual sheep selected for type and form perfections and have forgotten the fundamental precept that--

Ewes yearly by twinning
 Rich masters do make.
 The lambs from such twinnings
 For breeders go take.

We are now at the end of the string. The sheep industry is dying. It can be revived only when there are enough pounds of lamb to sell--along with the incidental wool clip--to pay production costs and return a margin of profit to the sheep owner. From here on, number and pounds of lamb are paramount, and enough of both will be the salvation of the sheep industry. The answer won't be found in the promotion of shows and sales--it is a fundamental breeding problem, as revealed by the ability of each ewe to produce. It is a rare industry indeed that can increase production under an operational method which employs fallacies and also discards otherwise 80 percent of its opportunity to gain the objective. Perhaps, in a large measure, this is why the sheep industry is in its present predicament.

Apart from the fundamental considerations involved in the breeding and selection of sheep for higher production there are some environmental conditions also which promote higher production. If ewes, for example, are in a moderately gaining condition of flesh at breeding time--a practice called flushing--the ewe will be most likely to conceive, to her maximum ability. This won't assure that the inherent poor milking ewe will raise twins induced by "flushing" at breeding time. Any notion that a ewe whose inheritance makes her a poor producer will rise to new heights in production as a result of flushing can be abandoned now. Flushing will reveal the true ability of the ewe under perfect conditions, and one can then determine whether her progeny are the sort to save to gain greater production.

In flushing ewes a moderate rate of gain is better than rapid gain. Ewes which are gaining rapidly at breeding time are slower to conceive, according to our tests, than those gaining less rapidly or those only holding steady. It seems possible, therefore, that the practice of flushing, unless judiciously applied, may gain one purpose and defeat another. Moderate flushing can usually best be accomplished by turning the sheep onto a fresh and better pasture, or by feeding some grain. There again, though, some pastures seem to delay conception so that too many repeat breedings are necessary. New-seeded or stubblefield meadows rich in young clover or alfalfa are most often suspected. The effect here, of course, may really be a reflection of slower conception under a too rapidly gaining condition. When all is said and done, moderate flushing seems to weigh out as a practice which promotes maximum opportunity for the ewe to reveal her true qualities, and on such a base sound decisions as to what and what not to save for breeding can be made.

There are some who advocate the culling out of all fat ewes at mating time--the thesis being that a fat ewe is a poor breeder. Actually, poor breeders--those which fail to yearn or to rear lambs--are usually fat ewes, but not all fat ewes are poor breeders. Those ewes which rear a good lamb or a good pair of lambs and also hold up in condition of flesh are the perfect flock ewes.

A method of checking on the ram's activity and fertility during the mating season is good husbandry. Yellow ochre dust placed on the ram's brisket each day will mark each ewe bred on the rump. Change the yellow color to Venetian red at the end of 16 days; and to prussian blue at the end of the second 16-day period. Red over yellow, or blue over red and yellow is plain evidence that

the ram is faulty and if all ewes show it the ram should be replaced. There will be no profit if the ewes don't lamb, and they won't lamb if the ram is sterile. The time to be certain is during the mating season. It is also a good time to determine whether the ram should be retained another season or not, or whether his progeny are likely to be highly fertile or not.

Winter feeding during pregnancy can make or spoil the chances of a good lamb crop, just as good feeding after lambing will stimulate maximum milk production or as poor feeding will cut it down. There are only three provisions for good winter feeding. First, the ewes should be in at least as good condition of flesh when lambing time comes as she was when bred. To be in that condition she must increase a minimum of 15 percent in weight, since this is the average loss at lambing. If she gains a little reserve she is best fitted for her next job. Second, the feeder should guard against any serious interruption in the feeding schedule. Sudden losses in weight predispose to pregnancy disease and likely some other troubles; and, third, the ration should be adequate to satisfy the requirements for energy, protein, vitamins, and minerals. Every ewe with the proper inheritance for high production should produce her maximum under such a feeding schedule. When poor production results under a good feeding schedule, it indicates need for additional removals from the flock.

And so, the summary of it all is that there is nothing unprofitable about high-producing sheep. There is evidence that the industry is regressing at an alarming rate because of low production developing from poor inheritance or bad environment, or both. In the face of a vast need for sheep in our rapidly developing grassland economy, it is time to substitute the realistic values measured in numbers and pounds of lamb and pounds of quality wool for the arbitrary, fluctuating standards based too exclusively on whims, notions, fads, and fallacies which have been developing during the past three-quarters of a century. From here on it won't be a case of accepting the returns sheep make; it is a case of breeding and selecting sheep that will make returns--and the returns must be sufficient to pay production costs and leave a margin of profit. With our breeding and rearing factory only about 60 percent efficient on the minimum base of at least a lamb from each ewe, and with a much higher productive rate as a possibility, the opportunity for a profitable and progressive sheep husbandry seems more than adequate to assure permanence to the industry if the objectives are earnestly pursued. The most vital need of the industry is to know where the superior germ plasma so acutely needed can be found. I have not seen an "ad" in 30 years which stated that this or that flock reared 150 percent lamb crop that averaged 90 pounds in weight at the age of 5 months and sheared 12 pounds of wool. That is all it will take to do the job.

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